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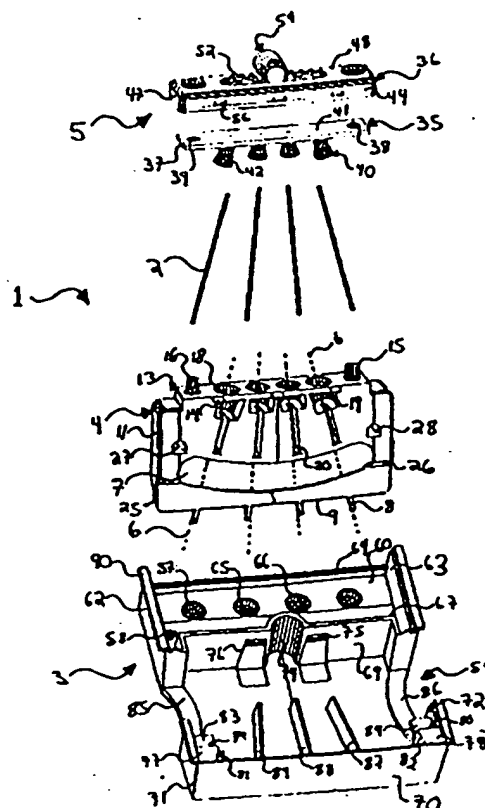
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*With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*(88) Date of publication of the international search report:
4 June 1998 (04.06.98)

(54) Title: IMMUNOASSAYS IN CAPILLARY TUBES

(57) Abstract

A fluorescent immunoassay employing the interior surface of a capillary tube is provided. Devices to permit immunoassays using one or more capillary tubes, an apparatus for use with the devices, and a process for screening for analyte in a sample using the devices and apparatus are also provided. Samples suspected of containing analyte are added to a disposable self-contained sample tray containing one or more sample wells, mixed with a reagent, drawn into one or more spaced-apart capillary tubes held within a disposable cartridge connected to an analytical apparatus, reacted with a binding member on the surface of the capillary tube, washed to stop the reaction, and dried by the apparatus. The capillary tube is then exposed to a signal generation device to create a fluorescence signal that is detected using a signal detector. The apparatus determines the presence of the analyte and optionally determines the amount of analyte present in the sample, and presents the results to the operator.



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INTERNATIONAL SEARCH REPORT

Int. National Application No.
PCT/US 97/12737

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G01N33/543 B01L9/06 G01N33/552 B01L3/00 G01N35/04
G01N21/03 //G01N33/94, G01N33/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B01L G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 95 21382 A (FIELDS ROBERT E) 10 August 1995 see abstract; figures see page 15, line 18 - line 24 ---	1-4,8,9, 45 20,35, 46,47
X A	EP 0 320 385 A (MELET SCHLOESING LAB) 14 June 1989 see abstract; figure 1 ---	1,9 6,23,35, 45,46
X A	US 4 116 638 A (KENOFF MICHAEL B) 26 September 1978 see the whole document ---	1,9,20, 21,27,46 23,35
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

30 March 1998

Date of mailing of the international search report

20.04.98

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INTERNATIONAL SEARCH REPORT

Int. .dional Application No

PCT/US 97/12737

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 33 42 428 A (HERAEUS CHRIST GMBH) 5 June 1985	1
A	see abstract; figures	6,22,23, 35,45
X	WO 93 19928 A (ABBOTT LAB) 14 October 1993	11-13
A	see claims 13-30; figure 10	37
X	WO 83 01119 A (COMMW SERUM LAB COMMISSION) 31 March 1983	20,21, 27,46
A	see the whole document	22,23, 31,45
X	EP 0 103 426 A (BLOCK MYRON J) 21 March 1984	20,25, 27, 46-48, 56,57
	see abstract	
	see page 2, line 7 - line 18	
P,X	US 5 624 850 A (KUMAR AMIT ET AL) 29 April 1997	20,21, 24,25, 27, 46-48, 54,56, 57,63
A	see column 2, line 35 - line 53 see column 3, line 5 - line 37 see column 6, line 1 - line 10 see column 9, line 25 - line 30; examples	53,62

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/12737

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9521382 A	10-08-95	AU 1745495 A CA 2182513 A EP 0752105 A JP 9511572 T	21-08-95 10-08-95 08-01-97 18-11-97
EP 0320385 A	14-06-89	FR 2624615 A AT 107541 T CA 1306218 A DE 3850368 D DE 3850368 T JP 1288769 A US 5047210 A	16-06-89 15-07-94 11-08-92 28-07-94 20-10-94 21-11-89 10-09-91
US 4116638 A	26-09-78	NONE	
DE 3342428 A	05-06-85	NONE	
WO 9319928 A	14-10-93	US 5376313 A AU 3929093 A AU 3934393 A AU 3934993 A AU 3935093 A AU 3967793 A AU 3968093 A CA 2129245 A CA 2129246 A CA 2132959 A CA 2132960 A EP 0755519 A EP 0634016 A EP 0637283 A EP 0746769 A EP 0632894 A EP 0632896 A JP 7505473 T JP 7505474 T JP 7505475 T JP 7505343 T JP 7505476 T JP 7506184 T	27-12-94 08-11-93 08-11-93 08-11-93 08-11-93 08-11-93 08-11-93 14-10-93 14-10-93 14-10-93 14-10-93 29-01-97 18-01-95 08-02-95 11-12-96 11-01-95 11-01-95 15-06-95 15-06-95 15-06-95 15-06-95 15-06-95 06-07-95

INTERNATIONAL SEARCH REPORT

International application No

PCT/US 97/ 12737

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See further information

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
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Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 97/12737

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims : 1-19; 31-34; 45(partly)

An (semi-)automated apparatus for screening an analyte in a sample, with a cartridge for holding a plurality of spaced-apart capillary tubes, and a tray for holding multiple portions of a sample.

2. Claims : 20-30; 46-64; 45(partly)

A process to analyse an analyte in a sample by a fluorescently-labelled-conjugate binding-assay in a capillary tube, said capillary tube being at least partly coated on its inner surface with a substrate capable of binding to a fluorescently-labelled conjugate, on at least portion of its interior surface and a process for preparing a glass capillary tube.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/12737

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9319928 A		WO 9320440 A	14-10-93
		WO 9320444 A	14-10-93
		WO 9320443 A	14-10-93
		WO 9320441 A	14-10-93
		WO 9320450 A	14-10-93
		US 5358691 A	25-10-94
		US 5646049 A	08-07-97
		US 5635364 A	03-06-97
		US 5605665 A	25-02-97
		US 5575978 A	19-11-96
		US 5627522 A	06-05-97
		US 5536471 A	16-07-96
		US 5507410 A	16-04-96
		US 5540890 A	30-07-96
		US 5482861 A	09-01-96
		US 5610069 A	11-03-97
		US 5578494 A	26-11-96
		US 5451528 A	19-09-95
-----	-----	-----	-----
WO 8301119 A	31-03-83	AU 8855182 A	12-05-83
		CA 1189449 A	25-06-85
		DK 233983 A	25-05-83
		EP 0089346 A	28-09-83
		JP 58501521 T	08-09-83
-----	-----	-----	-----
EP 0103426 A	21-03-84	US 4447546 A	08-05-84
		JP 1809121 C	10-12-93
		JP 5021185 B	23-03-93
		JP 59081560 A	11-05-84
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US 5624850 A	29-04-97	NONE	
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